

Firefighting Module

Shown below is *Amphib One*, a versatile firefighting vehicle that can operate effectively on either land or water. First developed by the City of Miami (Florida) Department of Fire, Rescue and Inspection Services, the amphibian was introduced last year by LTI Marine, an element of Ladder Towers Incorporated, Ephrata,



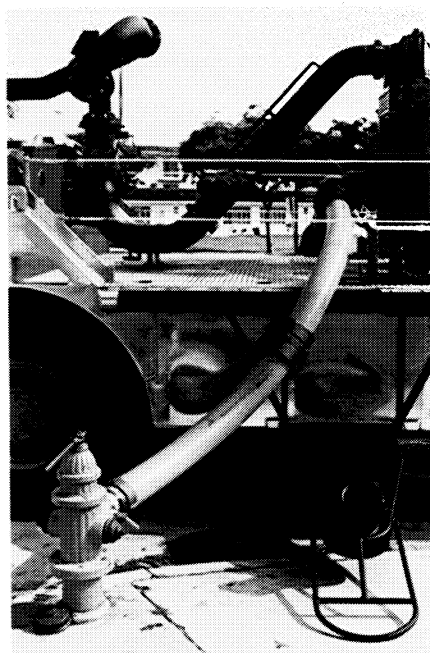
Pennsylvania, a leading producer of aerial ladders and towers for firefighting services.

Located just aft of *Amphib One's* soundproofed and air-conditioned cabin is the vehicle's key component: the Firefly II pump module, a commercial offshoot of a NASA/U.S. Coast Guard program involving development of a lightweight, helicopter-transportable firefighting module for quick response in combating shipboard or harbor fires. In directing the development, Marshall Space Flight Center (MSFC) drew upon its aerospace experience in high-capacity rocket engine pumps, lightweight materials and compact packaging. MSFC built and initially tested the module; manufacturing and sales rights were subsequently acquired by Kinetic Technology International (KTI), Santa Ana, California, whose president R. L. Chaney had worked with MSFC in the development phase and designed the commercial Firefly modules. KTI is now developing higher pressure and higher flow models of the Firefly.

Amphib One stemmed from the work of Louis D. Dechime—then chief of support services for Miami's Department of Fire, Rescue and Inspection Services and now associated with LTI Marine—in developing a fireboat for Miami's rather unusual requirements. Miami has 21 miles of shoreline, dozens of marinas, yacht clubs and boatyards, and a large number of uninhabited offshore islands where brush fires occur frequently. Dechime witnessed a NASA demonstration of the Firefly and, with assistance from MSFC, developed the idea of combining the Firefly II module with an amphibian vehicle to allow more rapid response to a shoreline fire incident than a fireboat could provide. The basic vehicle selected was a surplus LARC (Lighter, Amphibious Resupply Cargo) originally built for Army use in Vietnam.

The resulting craft is remarkably versatile. Its Firefly II pump module incorporates advanced technology in its engine, pump and electronic controls; power is supplied





by a gas turbine engine—a derivative of a helicopter engine—built by Detroit Diesel Allison Division of General Motors. Firefly's simplified design requires only minimal operator training; thus, *Amphib One* can be based at land fire stations and manned by existing fire apparatus crews. For overland travel, its compact size and tight turning radius enable it to maneuver through city streets en route to a marine incident. For entering the water, ramps are usually not necessary because *Amphib One* can negotiate steep grades on sand, coral beaches or rough terrain.

The craft is equipped with three monitors, or water cannons, two on the bow and one stern-mounted; when all three are operating (far left), Firefly II pumps more than 3,000 gallons a minute through the guns. The upper left photo shows a demonstration of *Amphib One's* ability to douse island brush fires; the bow guns can swivel through an arc of 90 degrees and they have an effective reach of well over 200 feet. At upper right is a simulation of another of the unit's multiple talents; it is feeding water to conventional land-based fire trucks at a location where there are no hydrants. The photo at left illustrates how *Amphib One* can operate on land by bypassing the unit's water intake plumbing and hooking up to a hydrant.

NASA-Marshall has been engaged in development of the module for nearly a decade. The center has conducted a number of demonstrations in cooperation with the Coast Guard and the Maritime Administration. The program moved into a new phase last year when MSFC initiated development of an improved, higher capacity module for the U.S. Navy. Capable of pumping 5,000 gallons a minute, it is designed for such applications as fighting onboard ship fires; emergency dockside water pumping; "dewatering" ships in danger of sinking; flood control; and emergency water supply at remote locations.